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Publication Title:

Disposable body fluids absorbent article

Abstract:

A disposable body fluid absorbent article includes, a liquid-absorbent core 4, the core 4 is provided in the vicinity of opposite side edges 11 extending in parallel to each other in a longitudinal direction thereof with depressed regions 18 tapering from an upper surface 16 toward a lower surface 17 of the core
298
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(54) ARTICLE ABSORBANT JETABLE POUR LIQUIDES ORGANIQUES
(54) DISPOSABLE BODY FLUIDS ABSORBENT ARTICLE

(57)

A disposable body fluid absorbent article includes, a liquid-absorbent core 4, the core 4 is provided in the vicinity of opposite side edges 11 extending in parallel to each other in a longitudinal direction thereof with depressed regions 18 tapering from an upper surface 16 toward a lower surface 17 of the core 4 and extending along a pair of imaginary lines A-A extending in the longitudinal direction so as to describe convex curves respectively facing a center line C-C bisecting a width of the core 4.

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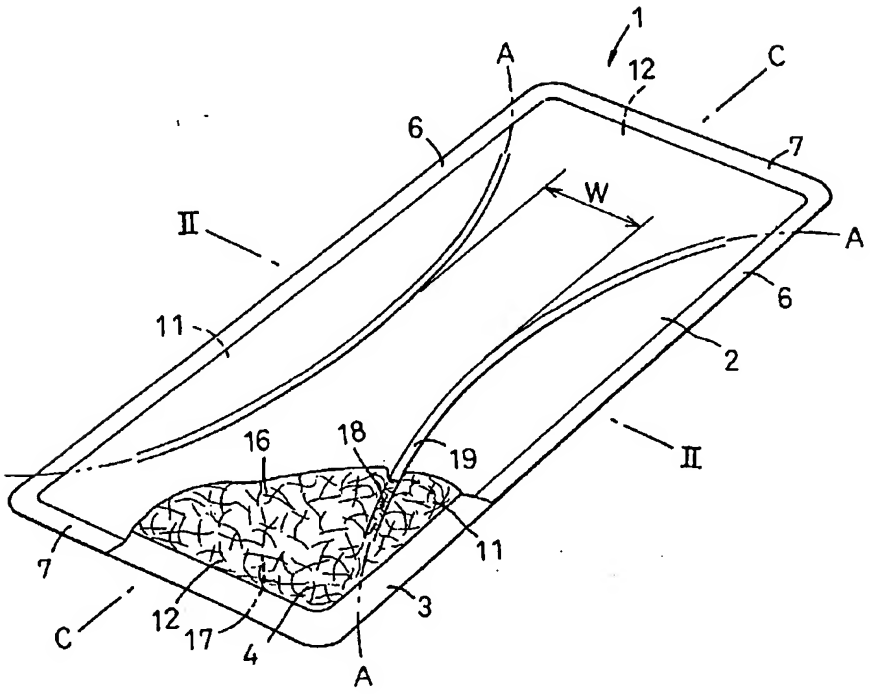
(54) **ARTICLE ABSORBANT JETABLE POUR LIQUIDES ORGANIQUES**

(54) **DISPOSABLE BODY FLUIDS ABSORBENT ARTICLE**



(57) A disposable body fluid absorbent article includes, a liquid-absorbent core 4, the core 4 is provided in the vicinity of opposite side edges 11 extending in parallel to each other in a longitudinal direction thereof with depressed regions 18 tapering from an upper surface 16 toward a lower surface 17 of the core 4 and extending along a pair of imaginary lines A-A extending in the longitudinal direction so as to describe convex curves respectively facing a center line C-C bisecting a width of the core 4.

A B S T R A C T

DISPOSABLE BODY FLUIDS ABSORBENT ARTICLE

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DISPOSABLE BODY FLUIDS ABSORBENT ARTICLE

The present invention relates to a disposable body fluids absorbent article such as a disposable diaper, a sanitary napkin or the like.

Japanese Utility Model Application Disclosure Gazette (Kokai) No. Hei1-141707, Japanese Utility Model Application Disclosure Gazette (Kokai) No. Hei2-84623 and Japanese Patent Application Disclosure Gazette (Kokai) No. Hei9-51913 disclose a disposable diaper including grooves each extending through a liquid-absorbent core in the direction of its thickness or grooves dividing the liquid-absorbent core in a plurality of sections in the transverse direction of the absorbent core. Along these grooves, topsheet and backsheet of the diaper are bonded to each other and thereby to define bottoms of the respective grooves.

Japanese Utility Model Application Publication (Kokoku) No. Hei5-39691 and Japanese Patent Application Disclosure Gazette (Kokai) No. Hei9-108262 disclose a sanitary napkin having a liquid-absorbent core compressed in the direction from a topsheet toward a backsheet or in the reverse direction to form grooves extending in the longitudinal direction of the napkin. The liquid-absorbent core presents

a remarkably high density along bottoms of the grooves.

Of the prior art as has been described above, the case in which the topsheet and the backsheet are bonded to each other to define the bottoms of the respective grooves can not free from any apprehension that an amount of body fluids flowing into the grooves might stay and give a wearer of the article such as a diaper a feeling of wetness due to which the wearer's discomfort increases. This is for the reason that the liquid-absorbent core of a disposable diaper or a sanitary napkin generally has a limited thickness and the side walls of the grooves are correspondingly limited in a total surface area even if the grooves are intended to absorb the amount of body fluids flowing into them.

Fig. 7 is a sectional view showing the napkin 101 described in the Japanese Utility Model Application Publication Gazette (Kokoku) No. Hei5-39691 taken in the transverse direction of the napkin 101. It is possible for the case of the napkin 101 to solve the problem that an amount of body fluids may stay in the grooves 102 since the liquid-absorbent core 104 underlies the bottoms 103 of the respective grooves 102. However, the regions of the liquid-absorbent core 104 immediately underlying the bottoms 103 have been compressed to have relatively high density and

rigidity of the core 104 is correspondingly high in the regions. To alleviate an adverse effect of the relatively high density, a measure has generally been adopted such that the opposite side walls 106 of the respective grooves 102 are tapered toward the bottoms 103 to describe a U- or V-shape in the section of the liquid-absorbent core 104 in the vicinity of each groove 102.

The napkin 101 of Fig. 7 formed on both side regions with such grooves 102 can not smoothly placed against a crotch region of the wearer with the napkin 1 being curved over its full width substantially in an inverted U-shape. On the contrary to the napkin 101 of Fig. 7, the napkin may be formed on its both side regions with the grooves by compressing the napkin from the backsheet toward the topsheet to facilitate the napkin to crook or curve over its full width substantially in an inverted U-shape. However, there is still an apprehension that the bottoms of the respective grooves having relatively high rigidity might directly stimulate soft skin of the wearer's crotch region. In addition, it is impossible for such napkin to offer desired function and effect of preventing any amount of menstrual discharge from leaking sideways by receiving and absorbing the amount of menstrual discharge flowing on the topsheet

transversely of the napkin in the grooves.

In view of the problem as has been described above, it is a principal object of this invention to provide an improved a disposable article such as a sanitary napkin facilitating the article to curve over its full width with the topsheet defining the outside and eliminating an apprehension that the napkin curved in this manner might stimulate the wearer's skin.

According to the present invention, there is provided a disposable body fluids absorbent article adapted to be placed against a crotch region of a wearer to absorb body fluids, comprising a liquid-absorbent core configured substantially in a narrow rectangle longitudinally oriented along the crotch region and having an upper surface covered with a liquid-pervious topsheet and a lower surface, and the liquid-absorbent core being provided in the vicinity of opposite side edges extending in a longitudinal direction thereof with depressed regions tapering from the upper surface toward the lower surface and lying along a pair of imaginary lines extending in the longitudinal direction so as to describe convex curves respectively facing a center line bisecting a width of the liquid-absorbent core.

According to one embodiment of the present invention, the depressed regions continuously extend along the imaginary lines.

According to another embodiment of the present invention, the depressed regions intermittently extend along the imaginary lines.

According to still another embodiment of the present invention, the liquid-absorbent core contains a fibrous component and a density of the fibrous component in the depressed regions is equal to or lower than a density of the fibrous component in the remaining region.

According to further another embodiment of the present invention, the liquid-absorbent core further contains superabsorptive polymer particles distributed only in a region defined inside the imaginary lines about the center line.

Fig. 1 is a perspective view showing a partially cutaway sanitary napkin constructed according to the present invention;

Fig. 2 is a sectional view taken along a line II-II in Fig. 1;

Fig. 3 is a view similar to Fig. 2 showing the sanitary

napkin as it is put on a wearer's body;

Fig. 4 is a view similar to Fig. 1 showing a sanitary napkin according to one embodiment of the present invention;

Fig. 5 is a view similar to Fig. 1 showing a sanitary napkin according to another embodiment of the present invention;

Fig. 6 is a view similar to Fig. 2 showing a sanitary napkin according to still another embodiment of the present invention; and

Fig. 7 illustrates a typical napkin of prior art in its transverse section.

Details of a disposable body fluids absorbent article according to the present invention will be more fully understood from the description given hereunder with reference to the accompanying drawings which illustrate the sanitary napkin as a specific embodiment of the present invention.

A sanitary napkin 1 shown by Fig. 1 in a partially cutaway perspective view comprises a liquid-pervious topsheet 2, a liquid-impervious backsheet 3 and a liquid-absorbent core 4 disposed between the topsheet 2 and the backsheet 3. The topsheet 2 and the backsheet 3 extend outward beyond a

peripheral edge of the liquid-absorbent core 4 and are put flat and bonded together along the extension.

The napkin 1 is substantially configured in a narrow rectangle defined by opposite side edges 6 extending in longitudinal direction and opposite ends 7 extending in transverse direction. The liquid-absorbent core 4 is also configured in a narrow rectangle defined by opposite side regions 11 and opposite end regions 12, of which the upper surface 16 is covered with the topsheet 2 and the lower surface 17 is covered with the backsheet 3. The upper surface 16 is formed with a pair of first grooves 18 extending along a pair of imaginary lines, for example, lines A-A as seen in Fig. 1, describing convex curves respectively facing a center line C-C bisecting a width of the napkin 1. The topsheet 2 is formed with a pair of second grooves 19 depressed and curved in coincidence with the pair of first grooves 18. The minimum dimension W by which the pair of first grooves 18 are spaced from each other transversely of the napkin 1 is preferably in a range of 20 - 40 mm.

Fig. 2 is a sectional view taken along a line II-II bisecting a length of the napkin 1. The liquid-absorbent core 4 may have a thickness gradually decreasing from its transversely middle region toward the opposite side edges of

the napkin 1 or may have a substantially uniform thickness except the regions defined by bottoms 21 of the first grooves 18 in which the thickness of the core 4 is abruptly decreased. Specifically, the thickness of the core 4 is approximately 1 ~ 15 mm in the transversely middle region and 10 ~ 80 % thereof in the regions defined by the bottoms 19. Each of the first grooves 18 has a width W of approximately 1 ~ 10 mm at its open top from which the first groove 18 is tapered toward its bottom 21. A depth of the first groove 18 gradually decreases from its longitudinally middle region toward its longitudinally opposite ends until the groove 18 disappears.

The liquid-absorbent core 4 comprises hydrophilic fibers such as fluff pulp or hydrophobic fibers treated to become hydrophilic of 100 ~ 40 % by weight, superabsorptive polymer particles of 0 ~ 60 % by weight and hydrophobic fibers of 0 ~ 20 % by weight. The core 4 has a remarkably low rigidity at the respective bottoms 21 of the first grooves 18 due to particular thickness and composition in these regions. A fiber density in the regions defined by the bottoms 21 is equal to or lower than that in the remaining region and an amount of the polymer particles in the regions defined by the bottoms 21 is equal to or less than that in

the remaining region. More preferably, the polymer particles are distributed only in the region extending from the respective imaginary lines A-A to the center line C-C of the core 4 and not distributed in the regions defined by the bottoms 21. By distributing the polymer particles in this manner, it is possible to avoid an apprehension that the polymer particles might absorb a partial amount of menstrual discharge and consequently form gel blocks. Such gel blocks might obstruct a smooth movement of menstrual discharge in transverse direction of the core 4. It is not apprehended also that the first grooves 18 might be filled up with the polymer particles swollen by absorption of menstrual discharge.

The topsheet 2 is made of a liquid-pervious nonwoven fabric or a porous plastic film and may be intermittently bonded to the upper surface 16 of the core 4, if desired. The backsheet 3 is made of a liquid-impervious plastic film and may be intermittently bonded to the lower surface 17 of the core 4, if desired. The backsheet 3 is applied on its lower surface with adhesive 23 by which the napkin 1 is fastened to an undergarment worn by a wearer and the adhesive 23 is covered with a release paper 24.

Fig. 3 is a view similar to Fig. 2 showing the napkin

1 as put on the wearer's body. The napkin 1 is fastened by means of the adhesive 23 to the inner surface of the undergarment 24 on a crotch region thereof and placed against a crotch region 27 of the wearer. As seen in Fig. 3, the napkin 1 is put on the wearer's body so that the napkin describes an inverted U-shape with the topsheet 2 defining the outer side thereof. With the napkin 1 according to the present invention, the opposite side regions 11 of the core 4 easily crook or curve downward along the first grooves 18 having a relatively low density and thereby ensure a good fitting to the wearer's crotch region without giving the wearer any feeling of incompatibility. Along the first grooves 18, the amount of menstrual discharge flowing thereinto can be absorbed by the core 4 through the topsheet 2 on opposite side walls 28 as well as on the bottoms 21 of the first grooves 18.

Fig. 4 is a view similar to Fig. 1 showing one embodiment of the present invention. According to the embodiment, the core 4 of the napkin 1 is formed with a plurality of first depressions 28 intermittently arranged along the pair of imaginary lines A-A and the topsheet 2 is formed with a plurality of second depressions 29 arranged in close contact with the first depressions 28, respectively.

The first and second depressions 28, 29 replace the first and second grooves 18, 19 in Fig. 1. The individual depressions are shaped to be circular or oval. Each of the first depressions 28 has a dimension substantially corresponding to the dimension of the first groove 18 as measured transversely of the napkin 1 and has a depth which is also substantially corresponding to the depth of the first groove 18.

Fig. 5 is a view similar to Fig. 1 showing a napkin according to another embodiment of the present invention. Similarly to the case as has been described in reference with Fig. 1, the napkin 1 according to the embodiment has a pair of first grooves 18 and the corresponding pair of second grooves 19 extending transversely of the napkin 1. The embodiment differs from the case of Fig. 1 in that the grooves 18, 19 formed on both sides of the napkin 1 come in contact on the center line C-C so that the grooves 18, 19 on both sides describe together a curved X-shape. In other words, the first and second grooves 18, 19 extend transversely of the napkin 1 along a pair of imaginary curves A-A which are convex toward the center line C-C.

Fig. 6 is a view similar to Fig. 2 showing a napkin 1 according to still another embodiment of the present invention. The napkin 1 differs from the precedent

embodiments in that the topsheet 2 is not formed with the pair of second grooves 19 to be aligned with the pair of first grooves 18 formed, also in the case of the napkin 1, on the core 4 and merely covers the respective open tops of the first grooves 18. The napkin 1 according to the embodiment also is easily deformable in the inverted U-shape as the napkin 1 is put on the wearer's body. However, it is apprehended that the napkin 1 might be less reliable than the napkin 1 of Fig. 1 in its function and effect to prevent the partial amount of menstrual discharge flowing on the topsheet 2 transversely of the napkin 1 from leaking sideways by receiving such amount of menstrual discharge in the pair of second grooves 19 and absorbing this through the bottoms as well as through the opposite side walls of the second grooves 19.

While the present invention has been described hereinabove by way of example in the form of sanitary napkin 1, it should be understood that the present invention is not limited to the sanitary napkin and applicable also to the other various disposable garments such as disposable diaper and disposable undergarment particularly for persons suffering from incontinence.

The disposable body fluids absorbent article according

to the present invention is provided on both sides of the liquid-absorbent core with the depressions tapering from the upper surface toward the lower surface of the liquid-absorbent core so that the body fluids may be absorbed through the bottoms as well as through the opposite side walls of these depressions. This unique arrangement is effective to avoid an apprehension that the body fluids might stay in these depressions and give the garment wearer undesirable feeling of high wetness and discomfort due to such feeling of high wetness. Furthermore, a rigidity of the liquid-absorbent core is remarkably lower along the bottoms of the respective depressions than in the vicinity thereof. Such unique distribution of the rigidity facilitates the liquid-absorbent core to crook or curve along the depressions over a full width of the core substantially in the inverted U-shape as the napkin is put on the wearer's body.

WHAT IS CLAIMED IS:

1. A disposable body fluids absorbent article adapted to be placed against a crotch region of a wearer to absorb body fluids, comprising a liquid-absorbent core configured substantially in a narrow rectangle longitudinally oriented along said crotch region and having an upper surface covered with a liquid-pervious topsheet and a lower surface, and

said liquid-absorbent core being provided in the vicinity of opposite side edges extending in a longitudinal direction thereof with depressed regions tapering from said upper surface toward said lower surface and lying along a pair of imaginary lines extending in said longitudinal direction so as to describe convex curves respectively facing a center line bisecting a width of said liquid-absorbent core.

2. The article according to Claim 1, wherein said depressed regions continuously extend along said imaginary lines.

3. The article according to Claim 1, wherein said depressed regions intermittently extend along said imaginary

lines.

4. The article according to Claim 1, wherein said liquid-absorbent core contains a fibrous component and a density of said fibrous component in said depressed regions is equal to or lower than a density of said fibrous component in the remaining region.

5. The article according to Claims 1, wherein said liquid-absorbent core further contains superabsorptive polymer particles distributed only in a region defined inside said imaginary lines about said center line.

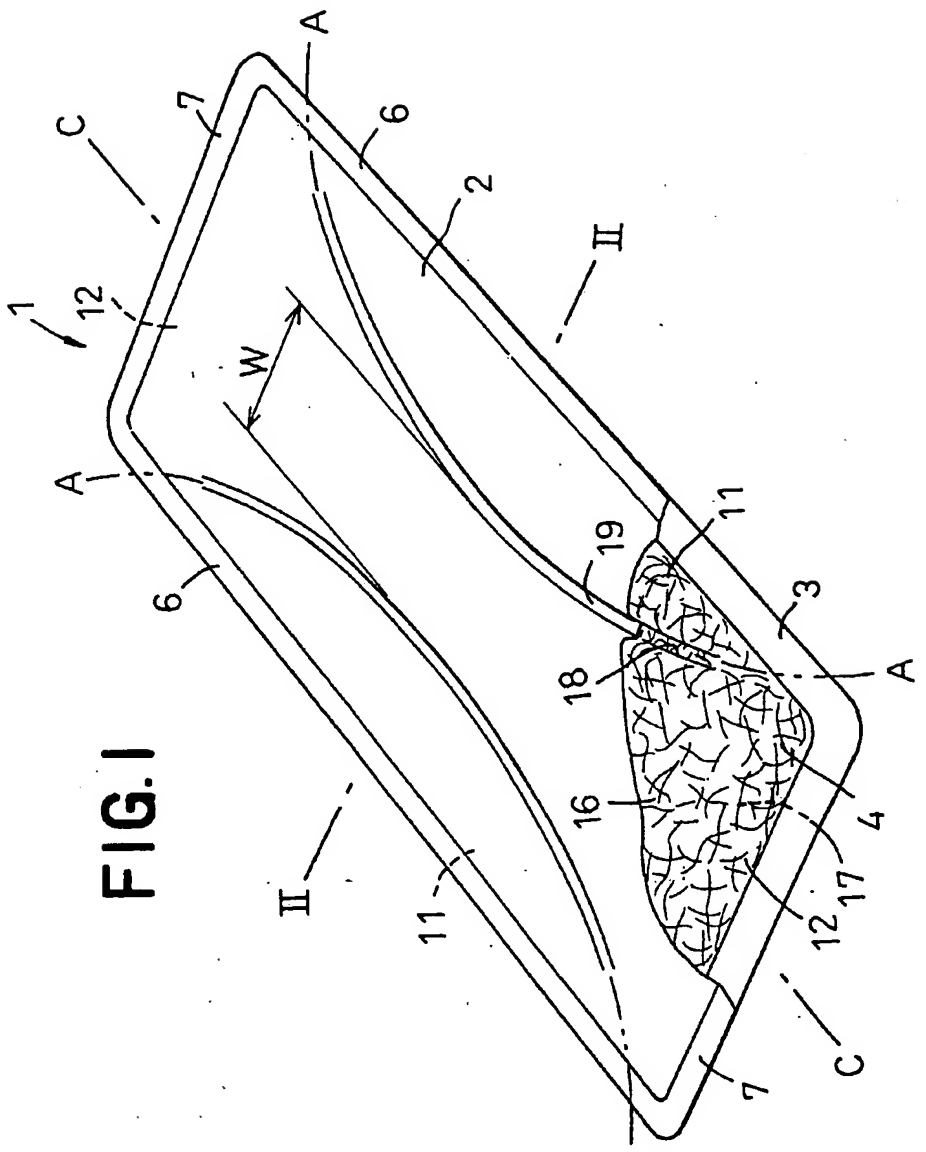


FIG. 1

FIG.2

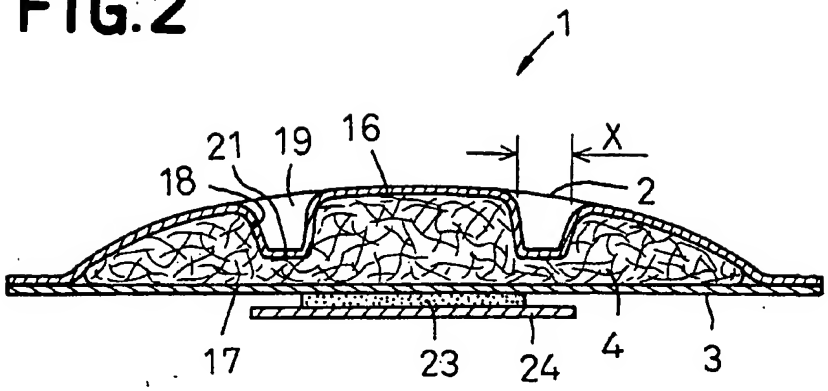
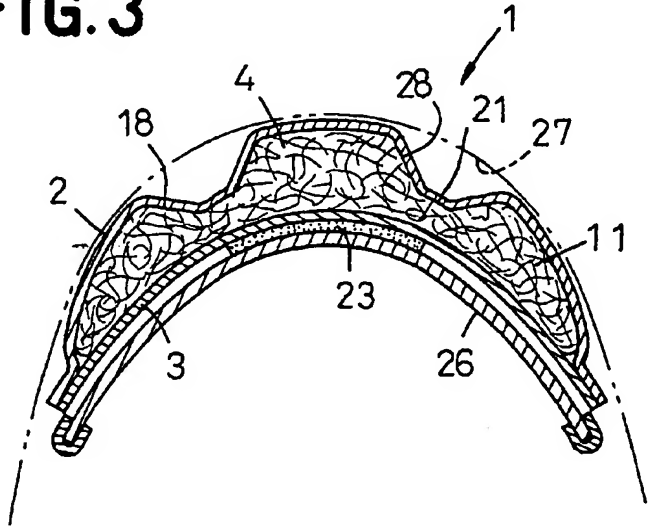


FIG.3



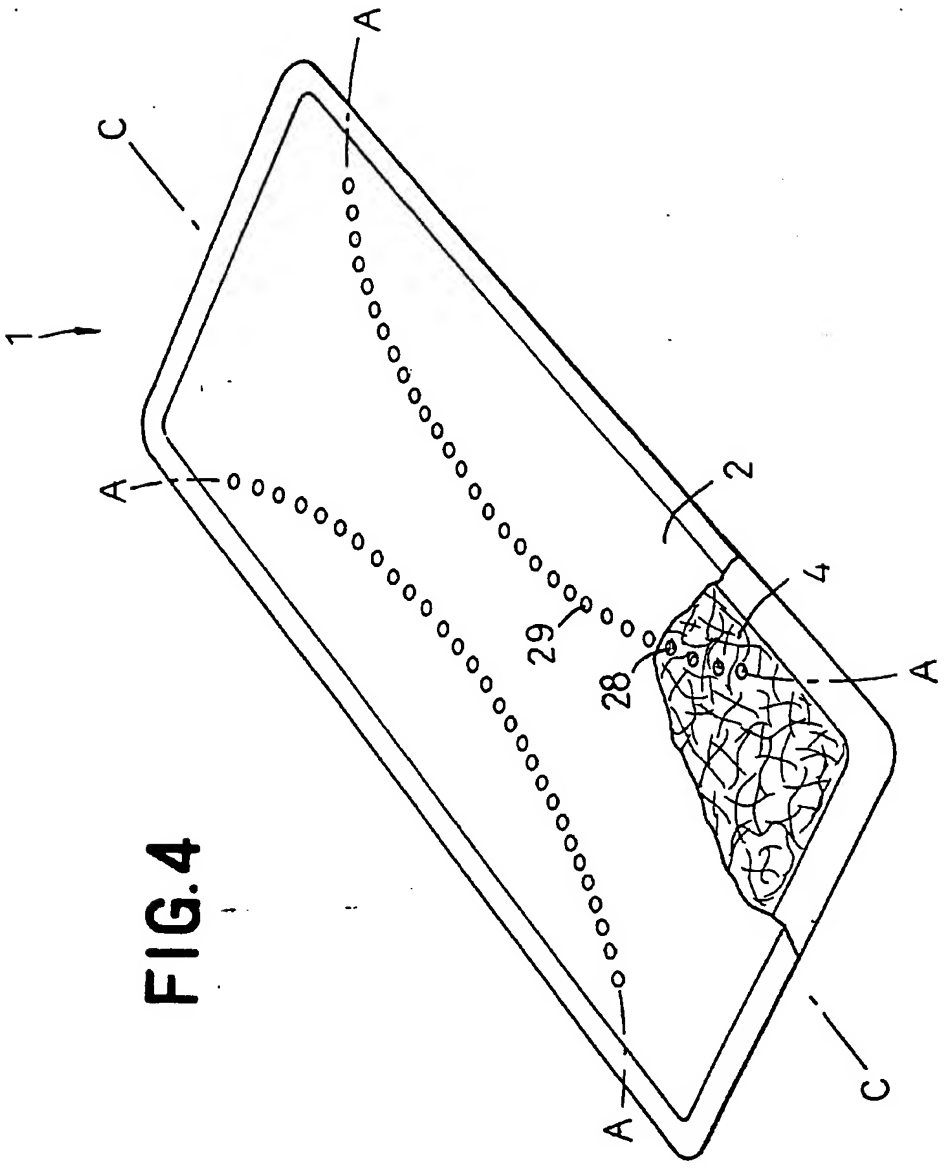


FIG.4

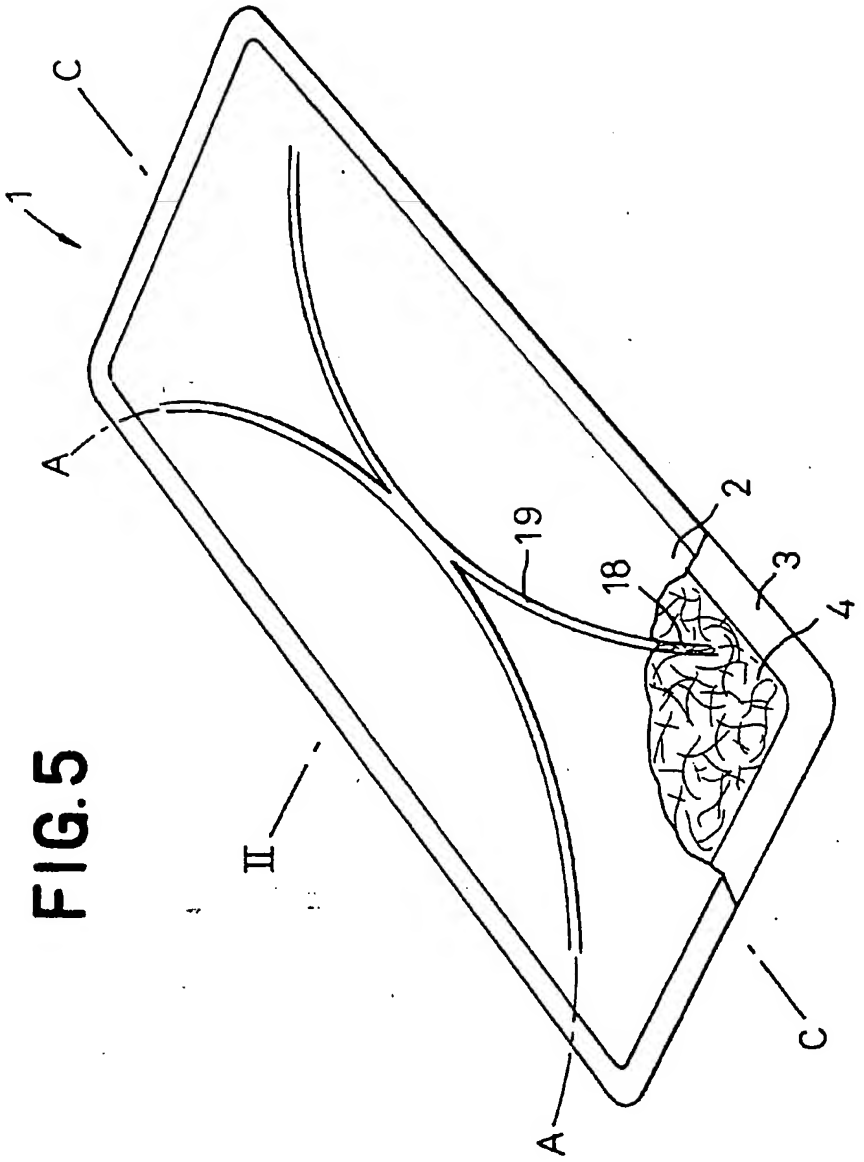


FIG.5

FIG.6

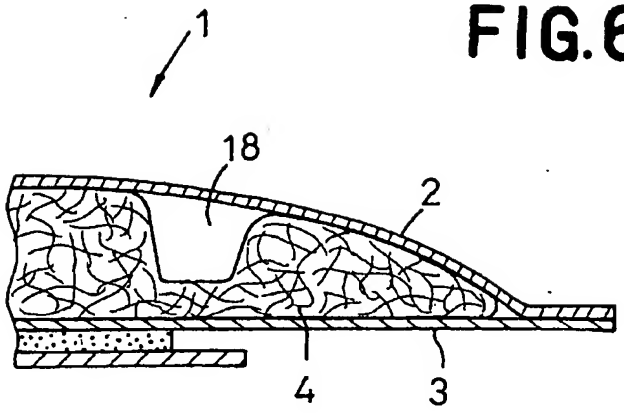


FIG.7